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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,252	10/31/2003	Cathleen H. Chang	BOI - 0062US	2942

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EXAMINER	
UMEZ ERONINI, LYNETTE T	
ART UNIT	**PAPER NUMBER**
1765	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/698,252	CHANG ET AL.	
	Examiner	Art Unit	
	Lynette T. Umez-Eronini	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/20/04 & 4/21/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This communication is in response to Applicants' Remarks in Amendment, filed 2/15/2006, which were persuasive in showing the former prior art of record failed to teach (c) periodically measuring the etching rate of said solution to determine if the etching rate is at or above the required minimum rate. Hence, a new Office Action is presented.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saukaltis (US 2,941,949) in view of Gulla (US 3,551,122) and further in view of Toprac (US 6,379,980 B1).

As to claims 1-20, Saukaltis teaches cleaning and pickling metal surfaces of aluminum using mineral acids such as phosphoric, sulfamic, and hydrofluoric acids (column 1, lines 15-19 and 25-30). Saukaltis discloses in one example, using 10 grams of sulfamic acid with sufficient water to make 100 cc when inhibited with 1/10 gram triphenyl sulfonium chloride (column 2, lines 17-29). Saukaltis further discloses cleaning and pickling metals by continuously passing the metal to be pickled through a number of baths in a regulated manner or by immersing the articles in the bath for a suitable period of time; and using the baths at 140° to 190°F (column 2, lines 39-47). The aforementioned reads on,

A process for combined chemically cleaning and etching parts made of aluminum and/or aluminum alloys comprising: (a) providing a cleaning and etching solution comprising:

(1) phosphoric acid;

(2) hydrogen fluoride;

(3) sulfamic acid; and

(5) balance water; and

(b) contacting said parts with said solution for a time sufficient to achieve the desired amount of cleaning and etching.

Saukaltis differs in failing to teach a cleaning and etching solution comprising:

the grams/liter of phosphoric, hydrogen fluoride, and sulfamic acid;

(4) 55-95 grams/liter of glycol ether;

(d) when the etching rate is below the required minimum rate, adding sufficient hydrogen fluoride to restore the etching rate above the required minimum rate; and

(e) periodically adding sufficient sulfamic acid to prevent the formation of scale made of hydrated aluminum fluoride, **in claims 1-7, 10-16; and 19**; and

wherein the process is run at ambient temperature, **in claims 8, 18, and 20.**

Gulla teaches typical organic solvents include propylene glycol and ethylene glycol; and ethers of ethylene glycol (column 3, lines 26-33).

Gulla illustrates glycol ether is known as a solvent and the combination of Saukaltis and Gulla further illustrates the specific combination of a cleaning and etching solution that comprises phosphoric, hydrogen fluoride, sulfamic and glycol ether is known. As a result, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select any concentration of the said components of cleaning and etching solution and temperature of the cleaning and etching process; along with (c) periodically measuring the etching rate of said solution to determine if the etching rate is at or above the required minimum rate; (d) adding sufficient hydrogen fluoride to restore the etching rate above the required minimum rate, when the etching rate is below the required minimum rate; and (e) periodically adding sufficient sulfamic acid to prevent the formation of scale made of hydrated aluminum fluoride, which would effectively accomplish the disclosed composition because it has been held that there is no invention where the difference in proportions is not critical and was ascertained by

routine experimentation because the determination of workable ranges is not considered inventive. See In re Swain and Adams, 70 USPQ 412 (CPA 1946).

Suakaitis in view of Gulla differ in failing to teach (c) periodically measuring the etching rate of said solution to determine if the etching rate is at or above the required minimum rate.

Toprac discloses, ". . . Commonly used techniques for determining material removal endpoints are well known to those of ordinary skill in the art, and for clarity and ease of illustration . . .. The endpoint monitor **140** outputs the time elapsed from the beginning of the removal process until the endpoint is reached (i.e., the total removal time). As may be applied herein, the term material removal tool **130** comprises any material removal tool (e.g., a tool for performing wet or dry etches, a plasma etch tool, a CMP tool) that uses an endpoint monitor 140 to determine a stopping point for the material removal process.

In some embodiments, where not all of the process layer is removed, the endpoint monitor 140 may also provide a measurement of the remaining thickness of the process layer by providing the time of the etch in the form of the endpoint time. For example, given known values for the etch rate of the process layer in question and the incoming thickness of this layer (from pre-etch metrology), the remaining thickness can be calculated as the incoming thickness minus the etch rate times the endpoint time for each wafer or lot of wafers processed. Values for the etch rate may be obtained by off-line characterization studies. In one optional embodiment, this known value of etch rate

can be updated by post-process measurement, on a periodic basis, of removed film thickness divided by the endpoint time for wafer(s) measured" (column 3, lines 35-67).

Toprac illustrates the etching rate can be measured periodically. Hence, it would be obvious to one having ordinary skill in the art at the time the invention was made to modify Suakaitis in view of Gulla by using a known method of periodically measuring the etch rate as taught by Toprac for the purpose of increasing profitability by monitoring the performance of the material removal tool (column 5, lines 10), which is used in monitoring the endpoint in a wet etch.

Response to Arguments

4. Applicant's arguments, see Remarks, filed 2/15/2006, with respect to the rejection(s) of claim(s) 1-20 under 35 U. S. C. 103 (a) as being obvious over Saukaltis (US 2,941,949) in view of Gulla (US 3,551,122) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Saukaltis (US '949) in view of Gulla (US '122) and Toprac (US 6,379,980 B1).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit 1765

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

ltue

April 26, 2006